

CLAIMS

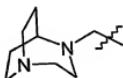
1. A compound in accord with formula I:



I;

5 enantiomers and pharmaceutically-acceptable salts thereof, wherein:

$\text{Q}$  is a moiety of formula II



II;

10  $\text{E}$  is selected from  $\text{C}_1\text{-}\text{C}_6$ alkyl,  $\text{C}_2\text{-}\text{C}_6$ alkenyl,  $\text{C}_2\text{-}\text{C}_6$ alkynyl,  $\text{C}_1\text{-}\text{C}_3$ alkoxy $\text{C}_1\text{-}\text{C}_3$ alkyl, thiazolyl, oxazolyl, imidazolyl, benzothiazolyl, benzoimidazolyl, quinoxalyl, furanyl, thiophenyl, phenyl, naphthyl, pyridyl, bezofuranyl, benzothiophenyl, quinolinyl or a bond, and

15  $\text{D}$  is selected from hydrogen,  $\text{C}_1\text{-}\text{C}_6$ alkyl, phenyl, phenylsulphanyl or pyridyl, wherein  $\text{D}$  may bear 1, 2 or 3 substituents selected from halogen, alkoxy or trifluoromethyl.

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2. A compound according to Claim 1, wherein:

$\text{E}$  is selected from a bond,  $\text{CH}_2\text{-CH}_2$ ,  $\text{CH=CH}$ ,  $\text{C}\equiv\text{C}$ , methoxymethyl, furan-2-yl, thiophen-2-yl, thiophen-3-yl, phenyl, naphthyl, pyrid-2-yl, pyrid-3-yl, bezofuran-2-yl, benzothiophen-2-yl, benzothiophen-3-yl, quinolin-2-yl or quinolin-3-yl, and

20  $\text{D}$  is selected from hydrogen, n-pentyl, phenyl, phenylsulphanyl or pyrid-2-yl, wherein  $\text{D}$  may bear 1, 2 or 3 substituents selected from halogen, alkoxy or trifluoromethyl.

25 3. A compound according to Claim 1, selected from:

3-(1,4-diazabicyclo[3.2.2]non-4-yl)-1-phenylpropane;

(1,4-diazabicyclo[3.2.2]non-4-yl)(5-phenylfuran-2-yl)methane;

(1,4-diazabicyclo[3.2.2]non-4-yl)(biphenyl-4-yl)methane;

(1,4-diazabicyclo[3.2.2]non-4-yl)(5-phenylthiophen-2-yl)methane;

(1,4-diazabicyclo[3.2.2]non-4-yl)(bezofuran-2-yl)methane;

(1,4-diazabicyclo[3.2.2]non-4-yl)(naphthalen-2-yl)methane;  
3-(1,4-diazabicyclo[3.2.2]non-4-yl)-1-phenylpropene;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(benzothiophen-3-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(4-(2-pyridyl)phenyl)methane;  
5 (1,4-diazabicyclo[3.2.2]non-4-yl)(6-bromopyridin-2-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(quinolin-3-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(quinolin-2-yl)methane;  
4-(4-phenyl-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(5-(pyridin-2-yl)thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
10 4-biphenyl-3-ylmethyl-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(pyridin-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(6-phenyl-pyridin-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(3-phenyl-propyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-oct-2-ynyl-1,4-diaza-bicyclo[3.2.2]nonane;  
15 4-(2-benzyloxy-ethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(4-bromo-furan-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-[4-(4-bromo-phenylsulfanyl)-benzyl]-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(4'-chloro-biphenyl-4-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(3'-trifluoromethyl-biphenyl-4-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
20 (1,4-diazabicyclo[3.2.2]non-4-yl)(5-(3-pyridyl)thiophen-2-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(5-(4-pyridyl)thiophen-2-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(4-(2-pyridyl)thiophen-2-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(4-(3-pyridyl)thiophen-2-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(4-(4-pyridyl)thiophen-2-yl)methane;  
25 (1,4-diazabicyclo[3.2.2]non-4-yl)(isoquinolin-3-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(4-phenylpyridin-2-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(5-phenylpyridin-2-yl)methane;  
(1,4-diazabicyclo[3.2.2]non-4-yl)(6-phenylpyridin-2-yl)methane;  
4-(4-bromo-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
30 4-(5-bromo-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(4-(4-methoxy)phenyl-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;

4-(4-(4-chloro)phenyl-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(5-(4-methoxy)phenyl-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(5-(4-chloro)phenyl-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(5-(3-chloro)phenyl-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
5 4-(2-quinoxalin-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(2-bromo-thiazol-5-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(thiazol-5-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane having;  
4-(2-phenyl-thiazol-5-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(2-phenyl-imidazol-5-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
10 4-(thiazol-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(benzothiazol-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(1-methyl-benzimidazol-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(3-methyl-5-phenyl-thiophen-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(2-phenyl-thiazol-4-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
15 4-(4-(3-bromo-phenyl)thiazol-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane;  
4-(4-phenyl-thiazol-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane, and  
4-(4-(biphen-3-yl)thiazol-2-ylmethyl)-1,4-diaza-bicyclo[3.2.2]nonane.

4. A method of treatment or prophylaxis of human diseases, disorders or conditions in which

20 activation of the  $\alpha 7$  nicotinic receptor is beneficial which comprises administering a therapeutically effective amount of a compound according to Claim 1.

5. The method according to Claim 4 comprising treatment of a disorder selected from anxiety, schizophrenia, mania or manic depression.

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6. The method according to Claim 4 comprising treatment of a disorder selected from neurological disorders, psychotic disorders or intellectual impairment disorders.

7. The method according to Claim 4 comprising treatment of a disorder selected from Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, or Attention Deficit Hyperactivity Disorder.

5 8. The method according to Claim 4 comprising treatment of a disorder selected from Parkinson's disease, Huntington's disease, Tourette's syndrome, or neurodegenerative disorders in which there is loss of cholinergic synapses.

9 10. The method according to Claim 4 comprising treatment of a disorder selected from jetlag, nicotine addiction, craving, pain, and for ulcerative colitis, which comprises administering a therapeutically effective amount of a compound of the invention.

15 10. The method according to Claim 4 comprising administering an amount of a compound sufficient to facilitate cessation of smoking,

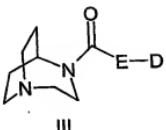
11. A pharmaceutical composition comprising a compound according to Claim 1 and a pharmaceutically-acceptable diluent or carrier.

12. A method comprising administering a therapeutically effective amount of a pharmaceutical composition according to Claim 11, for treating or preventing a condition or disorder selected from neurological disorders, psychotic disorders, intellectual impairment disorders, Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Attention Deficit Hyperactivity Disorder, anxiety, schizophrenia, or mania or manic depression, Parkinson's disease, Huntington's disease, Tourette's syndrome, neurodegenerative disorders in which there is loss of cholinergic synapse, jetlag, nicotine addiction resulting from exposure to products containing nicotine, craving, pain, and ulcerative colitis.

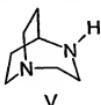
13. The use of a compound according to Claim 1 in the manufacture of a medicament for the treatment or prophylaxis of human diseases, disorders or conditions in which activation of the  $\alpha 7$  nicotinic receptor is beneficial.

14. The use according to Claim 13, for the treatment of neurological disorders, psychotic disorders, intellectual impairment disorders, Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Attention Deficit Hyperactivity Disorder, anxiety, 5 schizophrenia, mania, manic depression, Parkinson's disease, Huntington's disease, Tourette's syndrome, neurodegenerative disorders in which there is loss of cholinergic synapses, jetlag, pain, or ulcerative colitis.

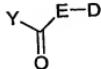
15. A method of making a compound of Formula I according to Claim 1, comprising:  
10 a) reacting a compound of formula III



wherein E and D have the meanings as defined in Claim 1, with a reducing agent selected from diborane or lithium aluminum hydride in an inert solvent selected from tetrahydrofuran, diethyl ether, toluene, heptane, or benzene at a temperature between -20 °C and the boiling point of the 15 solvent;  
wherein said compound of formula III is prepared by reacting a compound of formula V



with a compound of Formula IV,



IV

20 wherein Y represents a leaving group selected from, OH, halogen, Oalkyl, Oaryl, OCOalkyl, OCOaryl and azide by treating said compound of Formula V with a compound of formula IV at

-30-

0-120 °C in a solvent selected from *N,N*-dimethylformamide, dimethylsulfoxide, tetrahydrofuran, or chloroform, optionally in the presence of a base selected from 4-(*N,N*-

dimethylamino)pyridine, pyridine, triethylamine, and *N,N*-diisopropylethylamine, or

b) reductively aminating a compound of Formula IV with a compound of formula V,

5 wherein Y represents hydrogen.